



## Weather 101 – What Clouds Tell Recreational Boaters




You wouldn't leave the dock without first checking the local weather forecast. You can get weather information from TV, radio, Internet or personal VHF radio. While on the water, your VHF radio is the best source for weather warnings. Even so, at certain times of the year weather can change rapidly and you should continually keep a "weather eye" out, especially to the weather direction, in order to foresee changes that might be impending.

Cloud patterns are a tool you can use to predict or forecast weather. The type of cloud and direction of movement can warn you of weather changes that are imminent. Clouds are categorized by the altitude at which they appear and the shape that they take.

*(This is not an in-depth study of clouds, but an attempt to simplify the subject for use by recreational boaters.)*

Cloud Group	Cloud Height	Cloud Types
High Clouds = <b>Cirrus</b>	Above 18,000 feet	Cirrus Cirrostratus Cirrocumulus
Middle Clouds = <b>Alto</b>	6,500 feet to 18,000 feet	Altostratus Alto cumulus
Low Clouds = <b>Stratus</b>	Up to 6,500 feet	Stratus Stratocumulus Nimbostratus
<b>Clouds with vertical growth</b>		Cumulus Cumulonimbus

It is helpful to remember the following definitions of cloud shapes:

 A photograph showing a clear blue sky with several white, puffy cumulus clouds scattered across it. The horizon shows a calm sea and a distant landmass.	<b>Cumulus</b> meaning "heap, a pile, an accumulation"
 A photograph showing a sky filled with a thick, grey, layered stratus cloud cover. The ground below is a flat, open landscape with some low hills in the distance.	<b>Stratus</b> meaning "spread out, flatten, cover with a layer"
 A photograph showing a dark, heavy, and ominous nimbus cloud layer hanging low over a beach. The sand is wet and reflective, suggesting recent rain.	<b>Nimbus</b> meaning "rainy cloud"




Variations of cloud types are created by combining the cloud's shape/description with the altitudinal names as a prefix or suffix.

**Cirros** (high) or **Cirro** can be used with **cumulus** (heap) to indicate a **cirrocumulus** or high, lumpy cloud. Cirrocumulus clouds, sometime called "mackerel skies", can indicate the approach of a hurricane in the tropics. It can also be used with **stratus** (flat, layered) as in **cirrostratus** to indicate a high, flat or layered cloud.



**Alto** can also be used with **cumulus** and **stratus** to indicate **altocumulus** and **altostratus** that are middle altitude lumpy clouds and middle altitude layered clouds respectively.

**Nimbo** or **nimbus** might be used with **cumulus** or **stratus** to indicate a cloud formation that is producing precipitation. These clouds could be either **cumulonimbus** which would be a lumpy, vertically-rising rain cloud or **nimbostratus** which would be a sheet or flat-looking rain cloud.




**High clouds exist above 18,000 feet and are cirrus clouds.**

	<p><b>Cirrus</b> clouds are the most common of the high clouds. They are composed of ice and consist of long, thin, wispy streamers. Cirrus clouds are usually white and predict fair weather. Sometimes called mares tails, they stream with the wind. By watching the movement of cirrus clouds you can tell from which direction weather is approaching. The appearance of cirrus clouds usually indicates that a change in weather will occur within 24 hours.</p>
	<p><b>Cirrostratus</b> clouds are sheet-like, thin clouds that usually cover the entire sky. The sun or moon can shine through Cirrostratus clouds. Cirrostratus clouds usually come 12-24 hours before a rain or snowstorm.</p>
	<p><b>Cirrocumulus</b> are small, rounded puffs that usually appear in long rows. They are usually white, but may appear gray. Cirrocumulus are usually seen in the winter and indicate fair, but cold, weather. In the tropics, they may indicate an approaching hurricane.</p>



**Medium high clouds occupy altitudes of 6,500 feet to 18,000 feet.** These clouds are called **alto** clouds. Alto clouds are used to predict weather changes in 6 to 12 hours.

	<p>An <b>Altostratus</b> cloud usually covers the whole sky. The cloud looks gray or blue-gray. The sun or moon may shine through an Altostratus cloud, but will appear hazy. An altostratus cloud usually forms ahead of storms with continuous rain or snow.</p>
	<p><b>Altocumulus</b> clouds are grayish-white with one part of the cloud darker than the other. Altocumulus clouds usually form in groups. If you see Altocumulus clouds on a warm, sticky morning, be prepared for thunderstorms by late afternoon.</p>

**Low clouds, called stratus clouds, are at altitudes up to 6,500 feet.** These clouds form a solid sheet or layer of cloud mass.

	<p><b>Stratus</b> clouds are uniform gray in color and almost cover the entire sky. Light mist or drizzle is sometimes associated with Stratus clouds.</p>
	<p><b>Stratocumulus</b> clouds are low, lumpy and gray. Most form in rows with blue sky visible in between. Precipitation rarely occurs with Stratocumulus clouds, however, in frontal weather they may turn to Nimbostratus.</p>
	<p><b>Nimbostratus</b> clouds are dark gray with a ragged base. Rain or snow is associated with Nimbostratus clouds.</p>

### Clouds with vertical growth

	<p>Vertically developing clouds are the <b>Cumulus</b> type. These small, lumpy clouds are low "fair weather" clouds. However, as they develop vertically (by rising hot air) they may go from small, fair weather clouds to large, boiling, vertically-growing monsters called cumulonimbus.</p>
	<p><b>Cumulonimbus</b> clouds are generally known as thunderstorm clouds. High winds will flatten the top of the cloud into an anvil-like shape. Cumulonimbus clouds are associated with heavy rain, snow, hail, lightning, and tornadoes. The anvil usually points in the direction the storm is moving.</p>

If you can't remember all of the cloud names and formations, don't despair, you can always watch the clouds for two specific weather situations that indicate a high probability of a storm:

1. **A "lowering ceiling":** This means that the height of cloud formations continues to get lower and lower, usually caused by a warm front. As the ceiling lowers you will see clouds in the following order:
  - a. Cirrus
  - b. Cirrostratus
  - c. Altostratus
  - d. Stratus
  - e. Nimbostratus - storm clouds!
  
2. **Vertically building clouds:** Also, watch for cumulus (puffy) clouds that start to rapidly develop vertically to become *cumulonimbus* or "Anvil Shaped" thunderstorm clouds. On hot and humid days, these storms occur over water as the radiant heat from the land absorbs moisture from nearby water and rises to produce thunderheads. These storms can also indicate a cold front and may be preceded by squall lines, a row of black storm clouds. Wind shifts unpredictably and accelerates dramatically. Lightning can occur for miles in front of a storm and after the storm appears to have passed.

#### **Other things to look for that indicate an approaching weather change:**

1. In the northern hemisphere weather changes generally come from the west so scan the sky with your weather eye, especially to the west
2. A serrated horizon can indicate rough water in the distance
3. A sudden drop in temperature and change in the wind (increasing winds and/or seas) often means that a storm is near
4. If you have a barometer on your boat check it every two to three hours - a rapid drop in pressure means a storm is approaching
5. Monitor your marine weather channel for NOAA/NWS weather alerts

#### ***IF A STORM IS NEAR, have your group ...***

Verify all PFDs are securely adjusted  
Verify all hatches are closed and all gear is secure  
Head for the nearest shore that is safe to approach, and  
go ashore and seek low-lying shelter away from trees & flood zones  
or duck into the lee of land for protection from wind

#### ***IF CAUGHT IN A STORM ...***

Put bows into the wind and take waves at about a 40-45 degree angle.  
Watch for other boats and floating debris, pump water entering your craft  
If there is lightning, separate from others in your group  
Keep everyone **low** in his or her boat and balanced near the centerline.